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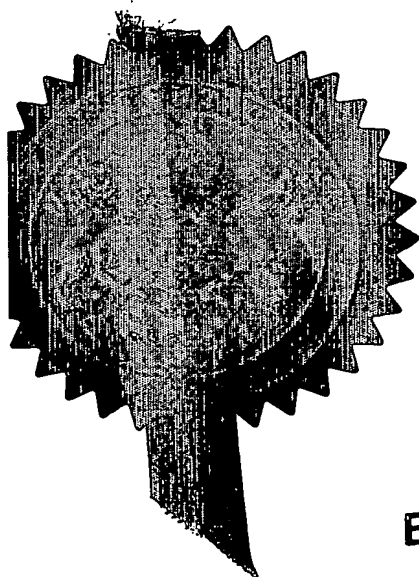
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P01/7700 0103-0713566.

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0313566.2

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57905GB(2)

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0313566.2

3. Full name, address and postcode of the or of each applicant (underline all surnames)

3M Innovative Properties Company

3M Center / 220 12W 01

I-94 and McKnight Road

St. Paul

MN 55144-1000, USA

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

USA / Delaware

07664097004

4. Title of the invention

Flocked substrates for use as scouring materials

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Cecilia A. Hill

OIPC Brussels

c/o Dept. of Legal Affairs

3M United Kingdom PLC

3M Centre

Cain Road, Bracknell

Berkshire, RG12 8ET

Patents ADP number (if you know it)

08459885002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

GB

0220585.4

05/09/2003

2002

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

a) any applicant named in part 3 is not an inventor, or

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See note (d))

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Continuation sheets of this form

Description 7

Claim(s) 2

Abstract

Drawing(s) 1

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77) 1

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date

Cecilia A. Hill

12/06/2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Lucy Stephens
Dept. of Legal Affairs
01344 858-683

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DUPLICATE

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FLOCKED SUBSTRATES FOR USE AS SCOURING MATERIALS

The present invention relates to substrates that are suitable for consumer use as scouring materials in cleaning surfaces in various environments, including domestic, industrial,
5 hospital and food industry environments. The invention relates in particular to substrates as described and claimed in our co-pending UK Patent Application No. 0220585.4 filed on 5 September 2002.

Substrates that provide a scouring action are widely used for cleaning in the
10 environments mentioned above, for example for cleaning cooking utensils and for cleaning surfaces in kitchens and bathrooms. Scouring substrates that are already known for such uses include resin-bonded non-woven webs of the type described in US-A-2 958 593. Those webs may incorporate abrasive particles to enhance their abrasive action.

15 Also known for scouring cooking utensils are pads that are formed from a continuous tow of crimped or undulated filaments, as described in US-A-4 991 362. Those pads may also incorporate abrasive particles to enhance their abrasive action.

It has also been proposed, in GB-A-1 539 477 and WO 02/06009, to use flocked
20 substrates for domestic cleaning and to enhance the abrasive action of the substrates by depositing abrasive particles (in the form of beads of resin) on the free ends of the flock fibres.

With the increasing use, in many environments, of surfaces that can be damaged by
25 aggressive abrasive materials, there is a growing demand from consumers for cleaning substrates that have a softer abrasive action but which, nevertheless, are able to remove material such as dirt, grease, burnt-on food etc. quickly and thoroughly. Consumers also require cleaning substrates that are themselves easy to clean (for example, simply by
30 rinsing after use) and retain no undesirable residues (e.g. pieces of food) that could subsequently contaminate other surfaces on which they might be used. It is an object of the present invention to enable those requirements to be met

Our co-pending UK Patent Application No. 0220585.4 describes, for use as a domestic scouring material, a flocked substrate wherein the flock comprises fibres that are arranged substantially perpendicular to the substrate and have a maximum length of 2.0 mm, the fibres being substantially free of abrasive particles. That application also describes a hand-held cleaning pad comprising a flocked substrate laminated to a layer of foam, wherein the flock comprises fibres that are arranged substantially perpendicular to the substrate and have a maximum length of 2.0 mm, the fibres being substantially free of abrasive particles. The foam can be of any type known to be suitable for domestic cleaning, including cellulosic foams having a density in the range of from 75 to 125 Kg/m³ and polyurethane foams having a density in the range of from 18 to 30 Kg/m³. A hand-held pad of that type offers the user two different cleaning actions that are both useful when cleaning hard surfaces, namely a scouring action provided by the flocked surface of the pad and a wiping action provided by the opposed foam surface of the pad.

The present invention is concerned with providing an alternative cleaning article that will also offer the user two different cleaning actions, one being a scouring action provided by a flocked surface similar to that of the hand pad claimed in UK Patent Application No. 0220585.4, and the other being a wiping action.

The present invention provides a cleaning article comprising a flocked wipe, wherein the flock comprises fibres that are arranged substantially perpendicular to the surface of the wipe and have a maximum length of 2.0 mm, the fibres being substantially free of abrasive particles.

The term "wipe" as used herein means liquid-absorbent web material that is suitable for use in either a dry or a damp condition to remove an unwanted substance from a surface by means of a wiping action. Wipes are often classified, in accordance with their durability, as "disposable" (meaning that they are intended to be discarded immediately after use), "semi-disposable" (meaning that it is possible to wash and re-use them a limited number of times), and "reusable" (meaning that they are intended to be washed

and re-used). Known wipe materials generally have a basis weight in the range of from 15 to 300 gm/m², although materials having a higher basis weight can be used, and comprise knitted, woven and non-woven materials. Wipe materials are often hydrophilic but can also be specifically constructed to absorb non-aqueous liquids, for example grease and oil.

In a cleaning article in accordance with the invention, the flock should be applied in such a way that part of the liquid absorbent surface of the wipe remains exposed.

Typically, both sides of a wipe provide the same wiping action. If, however, a cleaning article in accordance with the invention comprises a wipe in which the wiping action is provided by one side of the wipe only then the flock fibres should be applied so that part at least of the surface on that one side remains exposed.

By way of example, embodiments of the invention will now be described with reference to the accompanying drawings which are numbered to follow on from those of our above-mentioned co-pending application. In the drawings:

Fig. 4 is a diagrammatic cross-section of a cleaning article; and
Figs. 5 and 6 are plan views of cleaning articles.

The cleaning article 21 shown in Fig. 4 is a flocked substrate in which the flock comprises fibres 23 arranged substantially perpendicular to the substrate 25, and secured to the substrate by a layer of adhesive 27.

Flocked substrates of the general type shown in Fig. 1, and processes for manufacturing them, are well known. In the conventional processes, a layer of adhesive is applied to the substrate and, while the adhesive is still tacky, flock fibres are attracted to it electrostatically so that they become embedded at one end in the adhesive and stand up generally perpendicular to the substrate. The substrate is then heated in an oven to dry and cure the adhesive layer.

For the manufacture of the cleaning article 21, any wipe suitable for consumer use for cleaning surfaces can be used for the substrate 25. The wipe 25 may be "disposable" (meaning that it intended to be discarded immediately after use), "semi-disposable" (meaning that it is possible to wash and re-use it a limited number of times), or

5 "reusable" (meaning that it is intended to be washed and re-used). Known wipe materials generally have a basis weight in the range of from 15 to 300 gm/m², although materials having a higher basis weight could be used. Woven and knitted materials are suitable, as are non-woven materials including dry-laid, wet-laid and spun-bonded materials which may, as appropriate, be thermally-bonded, resin-bonded, ultrasonically-bonded, needle-

10 punched, hydro-entangled etc.

Materials suitable for disposable wipes include spun-bond and spun-lace non-woven materials having a basis weight in the range of from 15 to 75 g/m² and formed, for example, from PET, rayon, viscose, wood pulp, polypropylene, natural fibres, polyamide

15 or mixtures thereof. Examples of disposable wipe materials are available under the trade names: "Sontara" from DuPont; and "TenoLace" from Tenotex of Terno d'Isola, Italy.

Materials suitable for semi-disposable wipes include spun-lace non-woven materials having a basis weight in the range of from 75 to 250 g/m² and formed, for example, from

20 fibres or microfibres of polyester, polyamide, viscose. Examples of semi-disposable wipe materials are available under the trade names "Scotch-Brite™ Dusting Cloth" from 3M Company of St. Paul, Minnesota, USA; and "Sontara" from DuPont.

Materials suitable for reusable wipes include knitted, woven, thermo-bonded, latex-

25 coated, and chamois-type materials having a basis weight in the range of from 100 to 300 g/m² and formed, for example, from fibres or microfibres of PET, rayon, viscose, polypropylene, natural fibres, polyamide or mixtures thereof. An example of a reusable wipe is available under the trade name "Ideal" from Lever of Madrid, Spain.

30 Wipes are often hydrophilic but can also be specifically constructed to absorb non-aqueous liquids. Microfibre wipes, for example, are intended to remove grease from

surfaces.

Typically, both sides of the wipe 25 will provide the same wiping action. If, however, only one side of the wipe 25 provides a wiping action then the flock fibres 23 are applied to the wipe in such a way that a sufficient area of that one side of the wipe remains exposed and can be used to provide a wiping action. For example, in such a case the flock fibres 23 could be applied only to the other (non-wiping) side of the wipe 25.

As described in our above-mentioned co-pending application, any fibres known to be suitable for flocking and also suitable for use in the conditions for which the wipe 25 is intended (for example, able to withstand hot water and cleaning fluids) can be used for the flock 23. A particularly suitable material is polyamide, especially in the form of nylon 6 or nylon 6.6, but polyester fibres could also be used. The fibres preferably have a titer in the range of from 15 to 80 dtex (more preferably in the range of from 22 to 50 dtex) and are cut to a length no greater than 2.0 mm. It has been found that a particularly effective scouring action is achieved using fibres having a length of 0.8 mm and a titer of 44 dtex, or a length of 0.4 mm and a weight of 22 dtex.

The flock 23 may be applied evenly over one surface of the wipe 25, in which case it is preferably applied in an amount of from 150 to 180 g/m². Preferably, however, the flock is applied so that it forms a pattern over the surface of the wipe 25: the process by which that can be achieved is well-known and involves applying the adhesive 27 to the surface in the required pattern, usually by some form of printing process, with the result that the flock fibres will be adhered to the substrate only in the areas to which the adhesive has been applied. Use of a screen coating process for applying the adhesive in a desired pattern on the surface of the wipe material is preferred, because it enables a very thin layer of a high-viscosity adhesive to be applied: that, in turn, enables the liquid-absorbent properties of the non-coated regions of the surface and the liquid-absorbent properties of the other surfaces of the wipe (as appropriate) to be retained.

30

Figs. 5 and 6 show two alternative flock patterns that are suitable for the cleaning article

21, and a further alternative pattern is shown in Fig. 3 of our above-mentioned co-pending application. The patterns illustrated are all ordered patterns, but that is not essential.

- 5 Fig. 5 shows a pattern that is achieved by printing adhesive 27 onto the wipe 25 as two perpendicular sets of parallel lines; Fig. 6 shows a pattern that is achieved by printing adhesive 27 onto the wipe 25 as one set of parallel lines; and Fig. 3 of our above-mentioned co-pending application shows a pattern that is achieved by omitting the adhesive 27 from regularly-spaced rectangular patches of the wipe 25. When the surface
10 of the wipe 25 to which the flock is applied is liquid-absorbent, the flock is preferably applied in such a way that the liquid-absorbent properties are retained in the un-flocked areas. The flock is also preferably applied in such a way that any liquid-absorbent properties of the other surface of the wipe are unaffected.
- 15 The adhesive selected to bind the flock 3 to the wipe 25 should also be suitable for use in the conditions for which the wipe is intended (for example, able to withstand hot water and cleaning fluids). Preferably, it should not adversely affect either the flexibility of the wipe or, as already mentioned, the liquid-absorbency of the uncoated parts of the wipe surface. Suitable adhesives are acrylic adhesives and PVC (polyvinylchloride) resins, and
20 are applied in an amount (for example, about 90 to 140 g/m²) that will yield a very thin layer on the wipe 25 in those areas that are coated.

If desired, a further coating of adhesive can be applied on top of the first layer, after the flock has been applied and the first layer of adhesive has cured. This additional process
25 step is already known in the textile art for increasing the durability of flocked materials.

It has been found that a flocked wipe constructed as described above with reference to Fig. 4 will, through use of the flocked surface, provide an effective scouring action sufficient not only to clean work surfaces but also to remove burnt-on food from cooking
30 utensils using normal liquid detergents, despite the absence of any abrasive particles on the flock fibres 23. The scouring action has been found to be comparable to, and in some

cases better than, that of non-woven, non-scratch, domestic scouring materials that are currently commercially available including some that contain plastic (or other soft) abrasive particles. On the other hand, the absence of abrasive particles from the flock fibres 23 substantially eliminates the risk of any damage being done to the surface that is being cleaned. The unflocked surface or surface areas of the wipe, on the other hand, will provide the normal wiping action for which the wipe 25 is intended. The flocked surface or surface areas of the wipe 25 have been found not to trap residues of material removed from a surface that is being cleaned, so that any residues remaining on the wipe after use are easily removed by simply rinsing the wipe in water.

10

CLAIMS

1. A cleaning article comprising a flocked wipe, wherein the flock comprises fibres that are arranged substantially perpendicular to the surface of the wipe and have a maximum length
5 of 2.0 mm, the fibres being substantially free of abrasive particles.
2. A cleaning article as claimed in claim 1, in which the flock is applied to the wipe in such a way that at least one area of the liquid absorbent surface of the wipe remains exposed.
- 10 3. A cleaning article as claimed in claim 1 or claim 2, in which the flock is applied only on one surface of the wipe.
4. A cleaning article as claimed in any one of the preceding claims, in which the flock is non-uniformly disposed over a surface of the wipe.
- 15 5. A cleaning article as claimed in any one of the preceding claims, in which the flock is applied only to certain parts of the surface of the wipe.
6. A cleaning article as claimed in any one of the preceding claims, in which the wipe is
20 selected from the group consisting of disposable, semi-disposable, and reusable wipes.
7. A cleaning article as claimed in any one of the preceding claims, in which the wipe comprises a material having a basis weight in the range of from 15 to 300 gm/m².
- 25 8. A cleaning article as claimed in any one of the preceding claims, in which the flock comprises fibres having a length in the range of from 0.4 to 0.8 mm.
9. A cleaning article as claimed in any one of the preceding claims, in which the flock comprises fibres having a titer in the range 15 to 80 dtex.
- 30 10. A cleaning article as claimed in claim 7, in which the flock comprises fibres having a

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titer in the range of from 22 to 44 dtex.

11. A cleaning article as claimed in any one of the preceding claims, in which the flock comprises fibres having a length of 0.8 mm and a titer of 44 dtex.

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12. A cleaning article as claimed in any one of claims 1 to 10, in which the flock comprises fibres having a length of 0.4 mm and a titer of 22 dtex.

13. A cleaning article as claimed in any one of the preceding claims, in which the flock comprises fibres of a polyamide material.

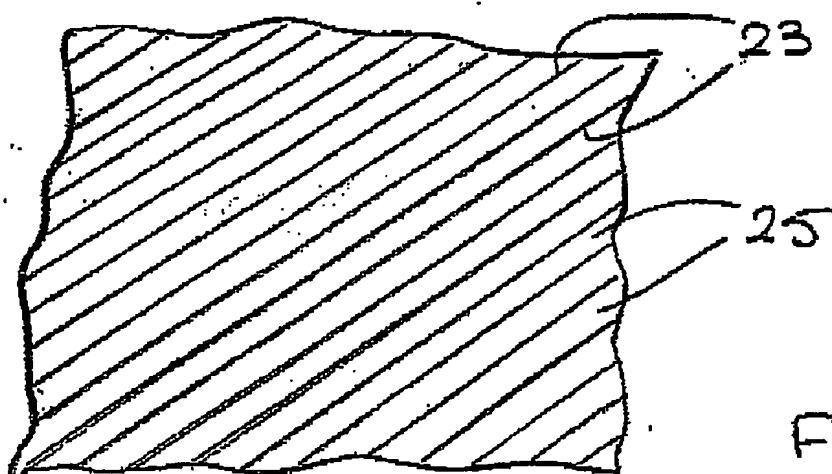
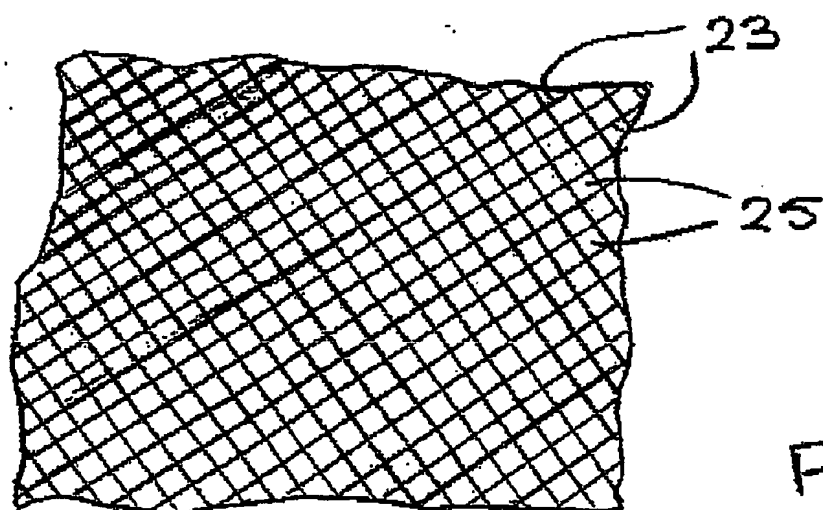
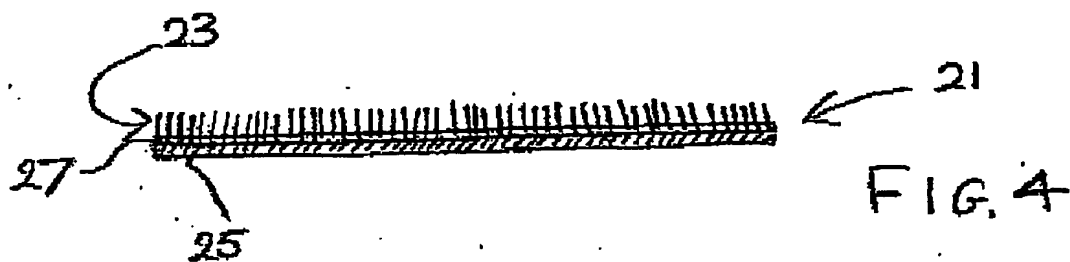
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14. A cleaning article as claimed in any one of the preceding claims, in which the flock is secured to the wipe by an adhesive layer that does not substantially alter the flexibility of the wipe.

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15. A cleaning article as claimed in claim 14, in which the flock is secured to the substrate by an acrylic adhesive or a PVC resin.

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